

Appln No. 10/553,525
Amdt date January 21, 2011
Reply to Office action of September 24, 2010

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) Active antiseptic water containing 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and substantially containing no chlorine.

2. (Withdrawn) An active antiseptic water-based fluid containing 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and substantially containing no chlorine.

3. (Withdrawn) The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is *sake*.

4. (Withdrawn) The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is wine.

5. (Withdrawn) The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is juice.

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6. (Currently Amended) A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, the method comprising: which comprise

using a treatment apparatus having: (1)

a treatment tank, (2)

a vibrating stirrer disposed inside the treatment tank~~[[,]]~~ and comprising an insulated vibrating stirrer having a vibration generator, a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, at least one vibration vane for vibration and at least one auxiliary vane fixed to the vibration rod, wherein the auxiliary vane is substantially devoid of vibration ability, a vibration vane-fixing member, and an insulation member for electrically separating the vibration rod or a vibration transmission member in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane and auxiliary vane,

~~(3)~~ a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and

~~(4)~~ a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank;

placing water or a water-containing fluid to be treated ~~(water-based fluid, including a fluid in the form of a paste)~~ in the treatment tank; and

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carrying out the steps of

(i) generating a desired vibration between 10 and 200 Hz in [[a]] the at least one vibration vane by ~~using a~~ the vibration generator, ~~and transmitting the vibrations to the vibration vane~~ to cause the at least one vibration vane to vibrate at an amplitude of 0.01 to 15 mm; ~~and~~

(ii) ~~breaking down, reducing, or removing halogen components in the water and converting the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions, by irradiating the photocatalyst layer or the photocatalyst and bactericidal metal with light for 30 minutes or longer; and~~

allowing electric current to flow for 30 minutes or longer in the water or water-containing fluid to be treated to break down, reduce, or remove halogen components in the water, and convert one or more of the nitrogen components contained in the water into nitrite ions, and sulfur components into sulfite ions, wherein

the at least one auxiliary vane or a combination of the at least one auxiliary vane and at least one component selected from a group of the vibration generator, the vibration rod, and the vibration vane-fixing member serves as an anode or a cathode.

7. (Currently Amended) The A production method according to claim 6, wherein the treatment apparatus further comprises for active antiseptic water or an active antiseptic water based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a

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~~photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, and (5) a magnetic force generation member disposed inside the treatment tank; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) breaking down, reducing, or removing halogen components in the water and converting the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions by irradiating the photocatalyst or the photocatalyst and bactericidal metal with light for 30 minutes or longer.~~

8.-10. (Cancelled)

11. (Currently Amended) The production method ~~for active antiseptic water or an active antiseptic water-based fluid~~ according to claim 6, wherein the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal is disposed in such a way ~~so as to~~ cover at least a portion of the vibration vane ~~and/or the auxiliary vane~~.

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12. (Currently Amended) The production method ~~for active antiseptic water or an active antiseptic water-based fluid~~ according to claim 6, wherein ~~a~~ the flow velocity of the treated fluid produced by vibration stirring is 150 mm/second or higher as measured with a three-dimensional electromagnetic flow meter.

13. (Currently Amended) The production method ~~for active antiseptic water or an active antiseptic water-based fluid~~ according to claim 6, wherein one or more of (1) the treated fluid, and/or (2) the photocatalyst layer, and/or the layer comprising a photocatalyst and a bactericidal metal are exposed to ultrasonic waves.

14. (Currently Amended) A production apparatus for active antiseptic water or an active antiseptic water-based fluid, comprising:

~~(1) a treatment tank; (2)~~

a vibrating stirrer disposed inside the treatment tank~~[[,]]~~ comprising

an insulated vibrating stirrer having a vibration generator, a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, at least one vibration vane for vibration and at least one auxiliary vane fixed to the vibration rod, wherein the auxiliary vane is substantially devoid of vibration ability, a vibration vane-fixing member, and an insulation member for electrically separating the vibration rod or the vibration transmission member in a non-

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immersed position in the treatment bath, near the vibration generator and away from the vibration vane and auxiliary vane;

(3)-a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank; [[,]] and

(4)-a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, wherein the light irradiator comprises (i)-a light source, (ii)-a light-leaking portion disposed near and/or in close contact with the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal inside the treatment tank, and (iii)-an optical fiber for optically connecting the light source and the light-leaking portion, and wherein the at least one auxiliary vane or a combination of the at least one auxiliary vane and at least one component selected from a group of the vibration generator, the vibration rod, and the vibration vane-fixing member serves as an anode or a cathode.

15. (Currently Amended) The production apparatus ~~for active antiseptic water or an active antiseptic water based fluid~~ according to claim 14, further comprising (5)-a magnetic force generation member disposed inside the treatment tank.

16. -18. (Cancelled)

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19. (Currently Amended) The production apparatus ~~for active antiseptic water or an active antiseptic water based fluid~~ according to claim 14, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal is disposed in such a way so as to cover a portion of the vibration vane and/or auxiliary vane.

20. (Currently Amended) The production apparatus ~~for active antiseptic water or an active antiseptic water based fluid~~ according to claim 14, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, and the light-leaking portion are formed on at least a portion of a plate-like body, and one or more a plurality of plate-like bodies are is disposed inside the treatment tank[[,]] facing in a direction that least obstructs a the flow produced by vibration generator stirring.

21. (Currently Amended) The production apparatus ~~for active antiseptic water or an active antiseptic water based fluid~~ according to claim 14, further comprising having an ultrasonic emitter.

22. (Currently Amended) A method for breaking down, reducing, or removing halogen components contained in water, the method comprising: which comprises using a treatment apparatus having: (1)

a treatment tank, (2)

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a vibrating stirrer disposed inside the treatment tank, the vibrating stirrer comprising:

an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, at least one vibration vane for vibration and at least one auxiliary vane fixed to the vibration rod, wherein the auxiliary vane is substantially devoid of vibration ability, a vibration vane-fixing member, and an insulation member for electrically separating the vibration rod or the vibration transmission member disposed in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane and the auxiliary vane,

(3) a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and

(4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside ~~and~~ or outside the treatment tank;

placing water or a water-containing fluid to be treated (~~water-based fluid, including a fluid in the form of a paste~~) in the treatment tank; and

carrying out the following steps ~~operations (i) and (ii)~~ for 1 minute or longer and less than 30 minutes, ~~the operations comprising the steps of:~~

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(i)-generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, [[and]]

(ii)-irradiating the photocatalyst or the photocatalyst and bactericidal metal with light,
and

allowing electric current to flow in the water or water-containing fluid to be treated,
wherein the at least one auxiliary vane or a combination of the at least one auxiliary vane and at
least one component selected from a group of the vibration generator, the vibration rod, and the
vibration vane-fixing member serves as an anode or a cathode.

23. (Currently Amended) The [[A]] method according to claim 22, wherein the
treatment apparatus further comprises for breaking down, reducing, or removing halogen
components contained in water, which comprises using (1) a treatment tank, (2) a vibrating
stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a
photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, (4) a
light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and
a bactericidal metal, disposed inside and/or outside the treatment tank, and (5) a magnetic force
generation member disposed inside the treatment tank; placing water or a water-containing fluid
to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank;
and carrying out operations (i) and (ii) for 1 minute or longer and less than 30 minutes, the
operations having the steps of (i) generating a desired vibration between 10 and 200 Hz in a

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~~vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light.~~

24.-26. (Cancelled)

27. (Currently Amended) The method ~~for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26~~ claims 22 or 23, wherein the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal is disposed in such a way so as to cover a portion of the vibration vane and/or auxiliary vane.

28. (Currently Amended) The method ~~for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26~~ claims 22 or 23, wherein a ~~the~~ flow velocity of the treated fluid produced by vibration stirring is 150 mm/second or higher, as measured with a three-dimensional electromagnetic flow meter.

29. (Currently Amended) The method ~~for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26~~ claims 22 or 23, wherein one or more of ~~(1)~~ the treated fluid, ~~and/or~~ ~~(2)~~ the photocatalyst layer, and ~~or~~ the layer comprising a photocatalyst and a bactericidal metal are exposed to ultrasonic waves.

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30. (Currently Amended) An apparatus for breaking down, reducing, or removing halogen components contained in water, comprising: (1)

a treatment tank; ~~(2)~~

a vibrating stirrer disposed inside the treatment tank, comprising

an insulated vibrating stirrer having a vibration generator, a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, at least one vibration vane for vibration and at least one auxiliary vane fixed to the vibration rod, wherein the auxiliary vane is substantially devoid of vibration ability, a vibration vane-fixing member, and an insulation member for electrically separating the vibration rod or the vibration transmission member disposed in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane and the auxiliary vane, (3)

a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and ~~(4)~~

a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, wherein the light irradiator comprises ~~(i)~~ a light source, ~~(ii)~~ a light-leaking portion disposed near ~~and/or~~ in close contact with the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal inside the treatment tank, and ~~(iii)~~ an optical fiber for optically connecting the light source and the light-leaking portion, wherein the at least one auxiliary vane or a combination of the at least one auxiliary vane and at least one component selected from a group of the vibration

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generator, the vibration rod, and the vibration vane-fixing member serves as an anode or a cathode.

31. (Currently Amended) The apparatus ~~for breaking down, reducing, or removing halogen components contained in water~~ according to claim 30, further comprising ~~(5)~~ a magnetic force generation member disposed inside the treatment tank.

32. -34. (Cancelled)

35. (Currently Amended) The apparatus ~~for breaking down, reducing, or removing halogen components contained in water~~ according to claim 30, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal is disposed in such a way so as to cover a portion of one or more of the vibration vane and ~~or~~ the auxiliary vane.

36. (Currently Amended) The apparatus ~~for breaking down, reducing, or removing halogen components contained in water~~ according to claim 30, wherein the photocatalyst layer, or the layer having a photocatalyst and a bactericidal metal, and the light-leaking portion are formed on at least a portion of a plate-like body, and one or more ~~a plurality of~~ plate-like bodies are ~~is~~ disposed inside the treatment tank, facing in a direction that least obstructs a ~~the~~ flow produced by vibration generator stirring.

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37. (Currently Amended) The ~~An apparatus for breaking down, reducing, or removing halogen components contained in water~~ according to claim 30, further comprising an ultrasonic emitter.

38. (New) The apparatus according to claim 14, wherein said at least one vibration vane vibrates at an amplitude of 0.01 to 15 mm at a vibration frequency between 10 and 100 Hz.

39. (New) The apparatus according to claim 30, wherein said at least one vibration vane vibrates at an amplitude of 0.01 to 15 mm at a vibration frequency between 10 and 100 Hz.